Name _____

AR7

Compare Amounts of Money

Essential Question How can you compare total values of collections of coins and bills?

NO.1.3.6 Use the *place value* structure of the base ten number system and be able to represent and compare decimals to hundredths in money (using models, illustrations, symbols, *expanded notation* and problem solving)

M.13.3.6 Apply money concepts in *contextual situations* up to $10.00

UNLOCK the Problem REAL WORLD

Alex and Cara each bought a card for their friend. They paid the amounts shown below. Who spent more money?

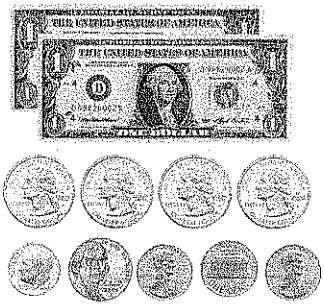
- How do you know how much money Alex and Cara have?

_____

- What do you need to compare?

_____

ALEX

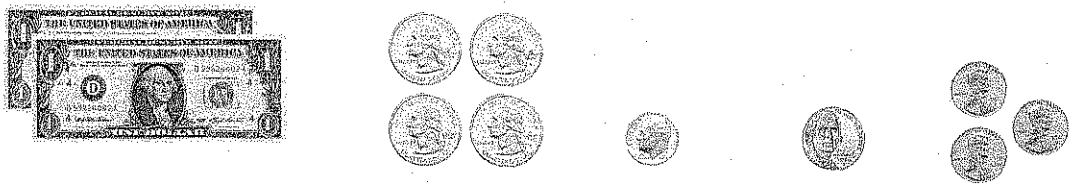


CARA

One Way Count and compare amounts of money.

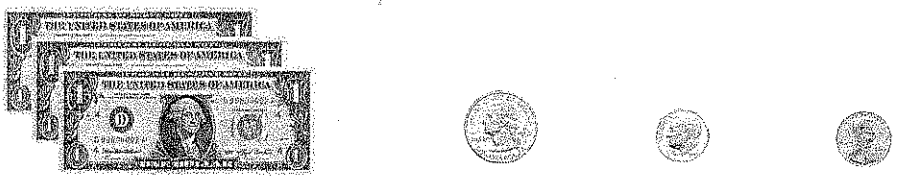
Materials ■ play money

STEP 1 Count Alex's money.



_____ → $3.00 → _____ → _____ → _____

Count Cara's money.



_____ → _____ → _____ → _____

Remember
< less than
> greater than

STEP 2 Compare the amounts of money.

Alex spent $3.18. Cara spent $3.36.

The dollars are the same. Compare the cents.

$0.18 < $0.36, so $3.18 < $3.36, or $3.36 ◯ _____.

So, _____ spent more money.

Math Talk Describe an example that shows it is possible to have a greater number of bills and coins, but a lesser amount of money.

Another Way Use place value to compare amounts of money.

Compare $2.49 and $2.47.

Use a chart.

DOLLARS	.	DIMES	PENNIES
$2	.	4	9
$2	.	4	7
2 = 2		4 = 4	9 > 7

Use expanded notation.

$2.49 = $2.00 + $0.40 + $0.09

$2.47 = $2.00 + $0.40 + $0.07

$2.00 = $2.00 $0.40 = $0.40 $0.09 > $0.07

The number of dollars is equal. The number of dimes is equal. Compare the number of pennies.

$9 > 7$, so $2.49 ◯ $2.47.

Math Idea

When the number of digits is the same, compare digits with the greatest money value first.

Share and Show MATH BOARD

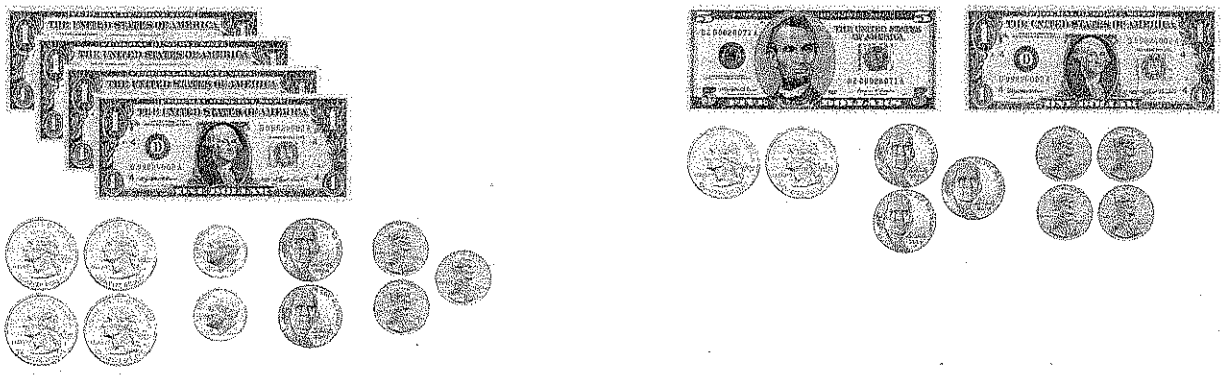
1. Which is the greater amount of money, 3 quarters or 6 dimes? Explain.

_____

Count to compare the amounts of money. Use <, >, or =.

2. 

_____ ◯ _____

3. 

_____ ◯ _____

Name _____

Use place value to compare the amounts of money.
Circle the greater amount.

4. $10.00 or $0.10

5. $3.82 or $3.90

Math Talk Explain how to use place value to compare $4.58 and $4.72.

On Your Own

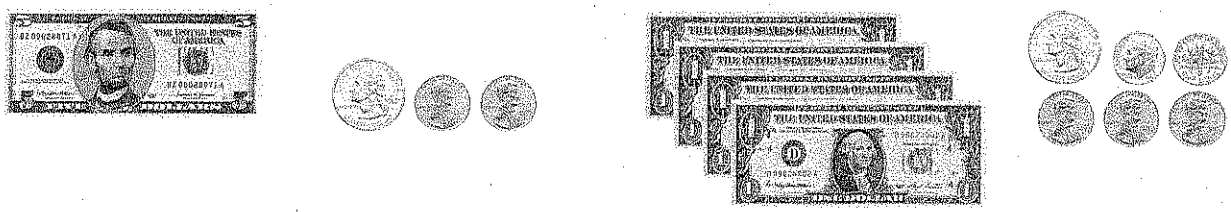
Count to compare the amounts of money. Use <, >, or =.

6. 

_____ ◯ _____

7. 

_____ ◯ _____

8. 

_____ ◯ _____

Use place value to compare the amounts of money.
Circle the greater amount.

9. $9.69 or $9.60

10. $1.05 or $0.75

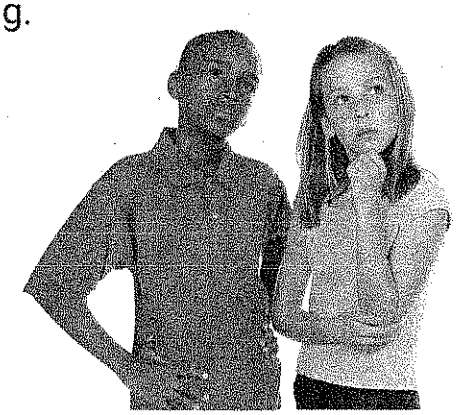
11. $6.18 or $8.09

Problem Solving REAL WORLD

H.O.T. **Sense or Nonsense?**

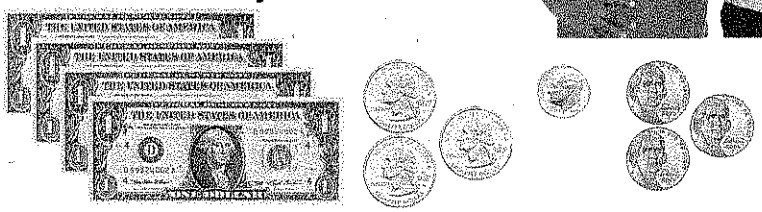
12. Connor and Katrina are comparing the coins they have to find out who has the greater amount of money. Whose answer makes sense? Whose answer is nonsense? **Explain** your reasoning.

I have 11 coins and bills. Katrina has 7 coins and bills. So, I have a greater amount of money.

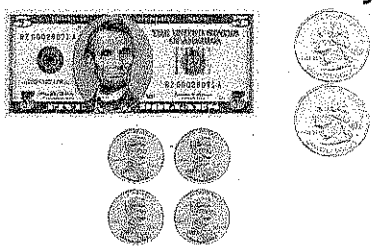


My money has a value of $5.54. Connor's money has a value of $5.00. So, I have a greater amount of money.

Connor's Money



Katrina's Money



Connor's Work

My Money	Katrina's Money
4 $1 bills	1 $5 bill
3 quarters	2 quarters
1 dime	4 pennies
3 nickels	7 coins and bills
11 coins and bills	

Katrina's Work

My Money	Connor's Money
$5.00	$4.00
$0.50	$0.75
+ $0.04	$0.10
$5.54	+ $0.15
	$5.00

- For the answer that is nonsense, correct the statement.

Name _____

Tell Time

Essential Question How can you read, write, and tell time to the nearest hour, half hour, and quarter hour?

M.13.3.3 Express time to the half hour and quarter hour using the terms half past, quarter after, quarter-until

CONNECT In one **hour** the hour hand moves from one number to the next on a clock. The hour hand tells us a lot of information.

UNLOCK the Problem REAL WORLD

TIME TO THE HOUR

One-Handed Clock

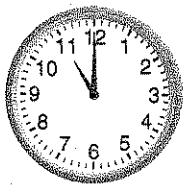
- What time is it when the hour hand is pointing exactly to the 11?

Time: _____

Analog Clock

An **analog clock** has a minute hand and an hour hand.

- What time does the clock show?



Time: _____

Math Talk How does the minute hand move while the hour hand moves from the 11 to the 12?

TIME TO THE HALF HOUR

- What time is it when the hour hand has moved halfway from the 11 to the 12?

Time: _____

A minute hand allows us to tell time more exactly. Most analog clocks have minute marks between the numbers. One hour has 60 minutes. One **half hour** has 30 minutes.

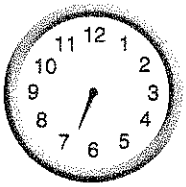
- How far around the clock does the minute hand move in one half hour?

_____

- What time does the clock show?

Time: _____

Time to the Quarter Hour



One-Handed Clock

Look at the clock at the right.

- What time is it when the hour hand is a little before the 7?

  _____

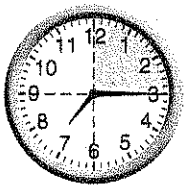
- If the hour hand is a little after the 7, what time is it?

  _____

- If the hour hand has gone halfway from 7 to 8, what time is it?

  _____

Analog Clock



A **quarter hour** has 15 minutes.

- How many quarter hours are there in one hour? _____
- How far around the clock does the minute hand move in a quarter hour?

  _____

- How many minutes are there in 2 quarter hours? _____
- If the hour hand has moved three quarters of the distance from the 7 to the 8, what time is it? _____

Write the time: _____

- The hour hand is a little after the _____. So, the time _____ makes sense.

Read the time:

- _____ fifteen
- fifteen _____ after _____
- quarter after _____

Digital Clock

A **digital clock** shows the time using only numbers. The number to the left of : shows the hour. The number to the right of : shows the minutes after the hour.

Write the time: _____

Read the time: _____ forty-five

- quarter until _____

Name _____

Share and Show

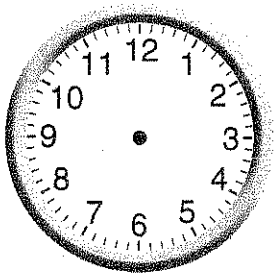
MATH BOARD

1. How would you write the time on the clock at the right?

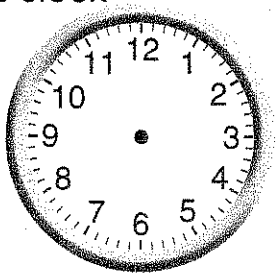
_____

Draw the hour hand and the minute hand.

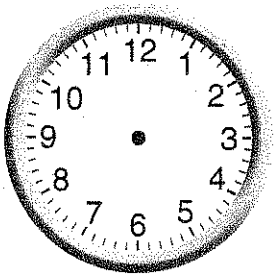
2. 9:00



3. quarter after seven o'clock



4. 10:30



Write the time.

5.

_____

6.

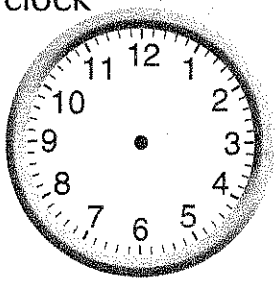
_____

Math Talk Explain how you know that the hour hand you drew in Exercise 4 makes sense.

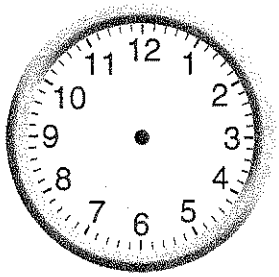
On Your Own

Draw the hour hand and the minute hand.

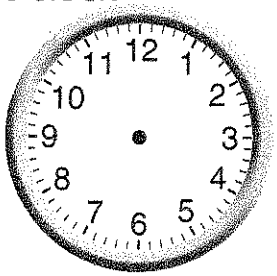
7. quarter until two o'clock



8. four o'clock



9. half past twelve o'clock

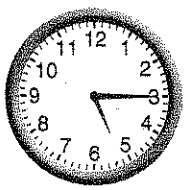


Write the time.

10.

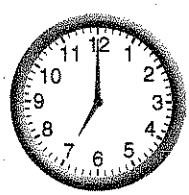
_____

11.



_____

12.



_____

Problem Solving REAL WORLD

13. Brooke left for school when the hour hand was a little before the 9 and the minute hand was on the 9. At what time did Brooke leave for school?

_____

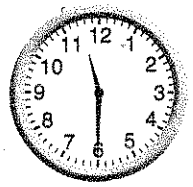
14. Derek called Jade when the hour hand was a little past the 9 and the minute hand was on the 3. At what time did Derek call Jade?

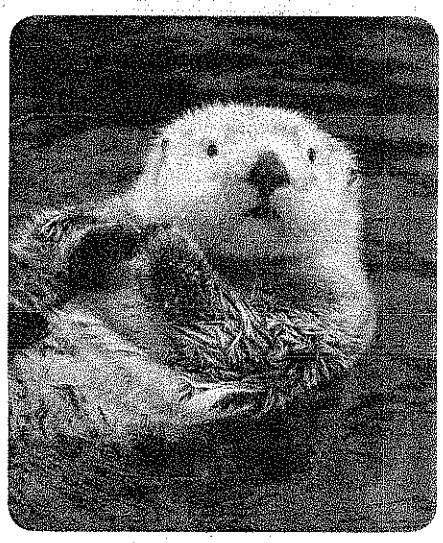
_____

15. Kate started her homework at 7:30. Leo started his homework at forty-five minutes after six. What is another way to write the time that Leo started his homework? _____

16. HOT How many quarter hours are in 45 minutes? _____

Use the clocks for 17–18.

Otter Program	
	
Start	End



17. Mark arrived a quarter hour before the otter program started. At what time did Mark arrive?

_____

18. Write Math **What's the Error?** Colleen said the program ends at half past two o'clock. What is Colleen's error? **Explain** your answer.

_____

_____

19. ★ **Test Prep** Laura ate lunch at quarter after one. What is one way to write the time?

Ⓐ 12:15 Ⓒ 1:15

Ⓑ 12:45 Ⓓ 1:45

Name _____

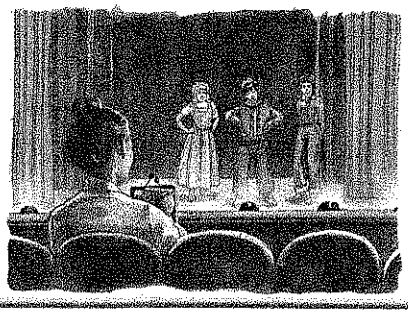
Elapsed Time on a Calendar

Essential Question How can you find elapsed time on a calendar?

CONNECT Time can be measured in small units, such as minutes and hours, by using a clock. It can be measured in larger units by using a **calendar** that shows the days, weeks, and months of a year.

M.12.3.1 Determine the number of days in a month, days in a year and identify the number of weeks in a year

M.13.3.1 Use a calendar to determine *elapsed time* from month to month



UNLOCK the Problem REAL WORLD

Tom's class begins practicing for the school play on October 3. The play is in 3 weeks. On what date is the school play?

- When will the class begin practicing?

  _____

- When is the play?

  _____

October

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	(3)	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

You can use a calendar to find elapsed time that is more than one day.

One Way Count by days.

Start on October 3. Shade the calendar above to count on one day to October 4, two days to _____, three days to _____, and so on until you have shaded 3 weeks, or _____days. The last shaded day shows the date for the play.

So, the school play is on _____.

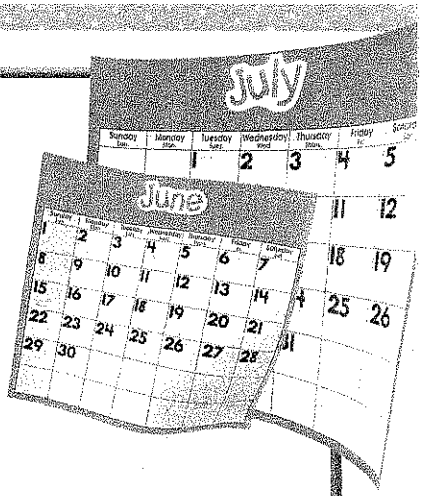
Units of Time
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
12 months = 1 year
365 days = 1 year
52 weeks = 1 year

Another Way Count by weeks.

Start on October 3. Count down the Friday column on the calendar. Circle October 10 for one week, October _____ for two weeks, and October _____ for three weeks.

Math Talk How can you use multiplying with 7 to find the number of days in 3 weeks? Explain.

Weeks and Days



Abbey visits her cousin. The first day of her visit is June 18. The last day of her visit is July 10. How long is Abbey's visit?

Shade each day of her visit. The first day of the visit is _____.

The last day of the visit is _____.

June

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

July

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Find June 18. Count 1 week to June 25.
Continue counting the weeks.

From June 18 until July 9 is _____ weeks. Now count the extra days, July 9 and July 10.

So, Abbey's visit is _____ weeks and _____ days long.

Share and Show

MATH BOARD

Use the calendars for 1–3.

January

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

1. Today is February 11. Nikki began reading her book on January 30. She read her book every day. Counting today, for how many days has Nikki been reading her book?

_____

2. How many more days are in March than in February?

_____

Name _____

3. Suppose it is January 14. Jack is leaving for vacation on March 7. How long is it until Jack starts his vacation? Write your answer in two different ways.

_____

Math Talk Explain how to find the number of days from January 10 through February 25.

On Your Own

Use the calendars for 4–7.

April

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

May

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

June

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

4. Ms. Hines is leaving for vacation on the last day of May. If today is the first day of April, how many days are there until Ms. Hines's vacation?

_____

5. Manny practiced the piano for one hour every day beginning April 26 through June 10. For how many hours has he practiced?

_____

6. Marshall's soccer camp begins on May 26. Carson's baseball camp begins 3 weeks and 4 days later. On what date does Carson's baseball camp begin?

_____

7. The first day of summer is the longest day of the year. In 2010, it was on June 21. Eight weeks and 4 days earlier was Earth Day. On what day was Earth Day?

_____

8. Rob says that May 15 is the second Thursday in May. What is Rob's error? What correct statement could Rob make?

_____

_____

_____

Problem Solving REAL WORLD

Use the diagram for 9–11.

August

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

SHOW YOUR WORK

9. Quentin's birthday is September 29. Today is September 3. How long is it until Quentin's birthday?

_____

10. A school fund raiser is ending October 12. The fundraiser lasted exactly 3 weeks. On what day did the fundraiser begin?

_____

11. H.O.T. Kendi and Aaron switch months volunteering at the public library. This year, Kendi is volunteering during August and October, while Aaron is volunteering during September. For these three months, how many more days does Kendi work than Aaron? How did you find your answer?

_____

_____

_____

12. ★ **Test Prep** How many days are there in 3 weeks?

Ⓐ 15 Ⓒ 21

Ⓑ 20 Ⓓ 22

Name _____

Temperature

Essential Question How can you measure temperature in degrees Celsius and degrees Fahrenheit?

M.12.3.3 Distinguish the temperature in contextual problems using the Fahrenheit scale on a thermometer

M.13.3.7 Read temperatures on Fahrenheit and Celsius scales in intervals of two and five

UNLOCK the Problem REAL WORLD

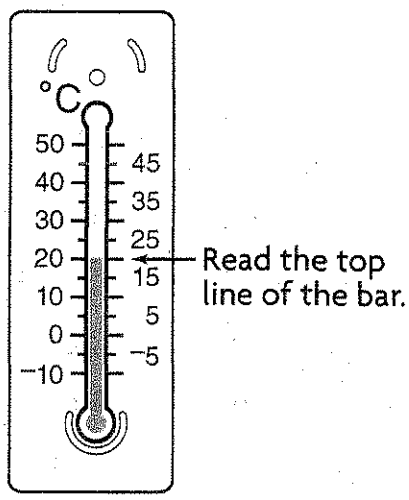
Lucy wants to measure the temperature using a thermometer. What is the temperature in degrees Celsius?

You can measure temperature in metric units as **degrees Celsius (°C)**.

To read a Celsius thermometer, find the number closest to the top of the bar. Use the scale like a number line.

On the thermometer at the right, each line on the scale stands for 5 degrees. The top of the bar on the thermometer shown goes up to the number ____.

So, the temperature shown is ____ °C.



Celsius and Fahrenheit

Degrees Celsius is one scale used to measure temperature. Another scale used to measure temperature is degrees Fahrenheit.

Here are some temperatures for each scale:

Temperature in Celsius and Fahrenheit		
Event	**Celsius**	**Fahrenheit**
Water boils	100°C	212°F
Body temperature	37°C	98.6°F
Summer day	32°C	85°F
Room temperature	20°C	68°F
Water freezes	0°C	32°F

Math Idea

The Celsius and Fahrenheit scales use different numbers to describe the same temperature.

Below are some activities you might do at different temperatures.

			
freezing 0°C, 32°F	cool 10°C, 50°F	pleasant 20°C, 68°F	hot 30°C, 86°F

Example

Michael went outside and looked at the thermometer shown. What is the temperature?
Is the weather outside hot, pleasant, cool, or freezing?

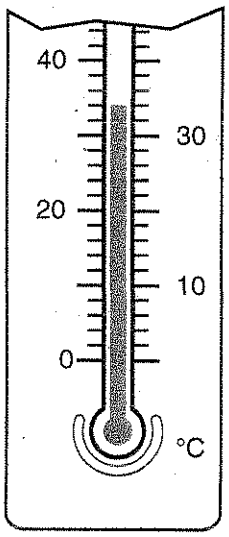
First read the thermometer.

The bar is ____ lines above 30. Each line is 2 degrees.

So, the temperature is ____ °C.

Look at the pictures above. When it is 30°C, the weather is hot.

So, the weather outside is _____.

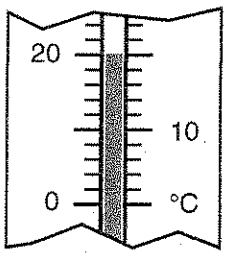


Share and Show

MATH BOARD

Write the temperature. Then write *hot, pleasant, cool,* or *freezing* to describe each temperature.

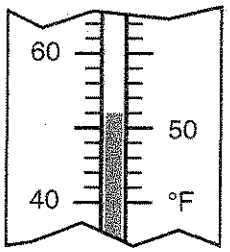
Math Talk Explain how knowing the outside temperature can help you decide what to wear to school.

1. 

The bar goes up to _____.

So, the temperature is ____ °C.

This temperature is _____.

2. 

The bar goes up to _____.

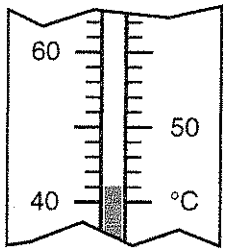
So, the temperature is ____ °F.

This temperature is _____.

Name _____

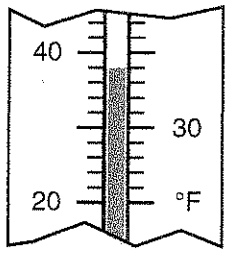
On Your Own

Write the temperature. Then write *hot, pleasant, cool,* or *freezing* to describe each temperature.

3. 

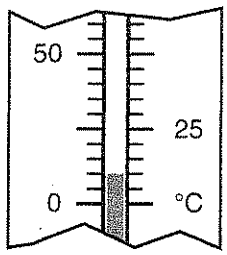
_____ °C

_____

4. 

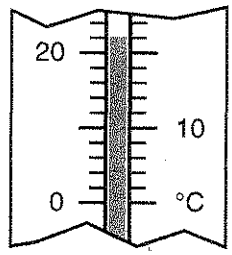
_____ °F

_____

5. 

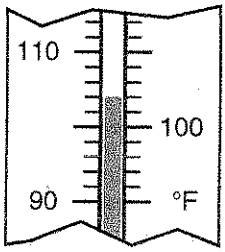
_____ °C

_____

6. 

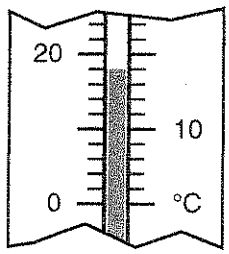
_____ °C

_____

7. 

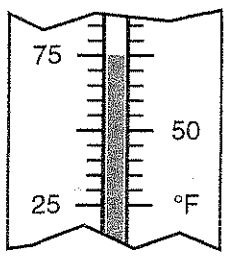
_____ °F

_____

8. 

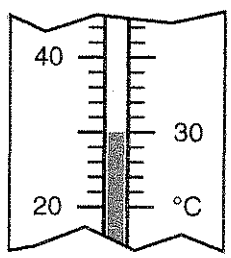
_____ °C

_____

9. 

_____ °F

_____

10. 

_____ °C

_____

Circle the better temperature for the activity.

11. swimming

32°C or 0°C

12. sledding

66°F or 37°F

13. planting flowers

6°C or 21°C

14. ice skating

34°F or 91°F

15. raking leaves

17°C or 35°C

16. bike riding

75°F or 43°F

17. building a snowman

5°C or 22°C

18. making sand castles

31°C or 12°C

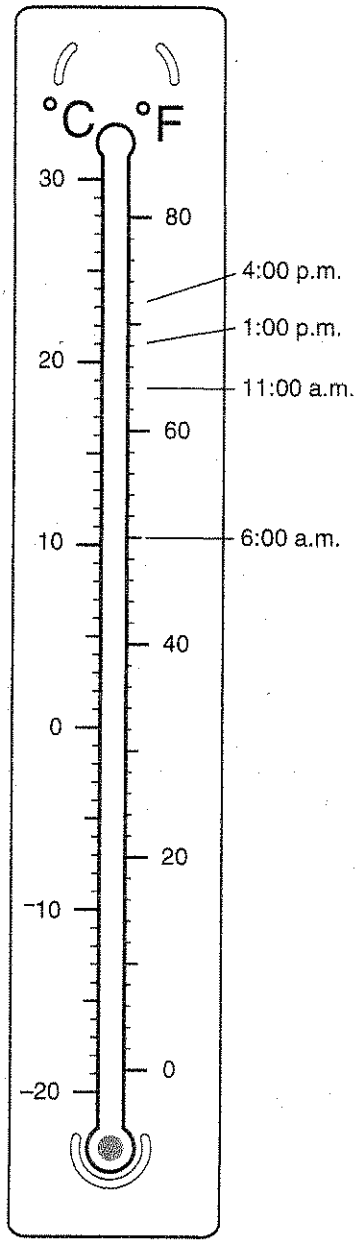
19. going on a hike

20°F or 68°F

Problem Solving REAL WORLD

TEST PREP

The thermometer shows the temperature at several times during a spring day. Use this thermometer for 20–24.



20. What was the lowest temperature recorded, in °C?

_____

21. What was the highest temperature recorded, in °F?

_____

22. HOT How much did the temperature increase during the day, in °F? How do you know this?

_____

_____

23. HOT Look at the pattern of the temperatures in °C and °F. Based on this pattern, what do you think 5°C is in °F? **Explain.**

_____

_____

_____

24. Write Math List 3 activities that would be appropriate to do outdoors at 1:00 p.m. **Explain** your reasoning.

_____

25. ★ **Test Prep** Ethan went snow skiing yesterday. Which of the following was most likely the temperature while Ethan was skiing?

Ⓐ 78°F Ⓒ 45°F

Ⓑ 60°F Ⓓ 21°F

Name _____

Customary Units for Length

Essential Question How do you know which customary unit to use to measure the length of an object or a distance?

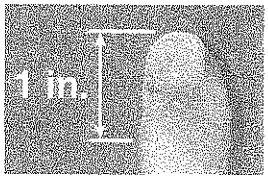
M.12.3.4 Demonstrate the relationship among different *standard units*

M.13.3.9 *Estimate* and measure length, *capacity/volume* and *mass* using appropriate customary units

UNLOCK the Problem REAL WORLD

Length is the measurement of distance between two points. Customary units used to measure length and distance are **inch (in.)**, **foot (ft)**, **yard (yd)**, and **mile (mi)**.

Customary Units for Length
1 foot = 12 inches
1 yard = 3 feet or 36 inches
1 mile = 1,760 yards or 5,280 feet



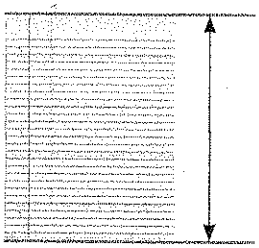
The length of your thumb from the tip to the knuckle is about 1 inch.

Name some things that are about 1 inch long.

_____

_____

_____



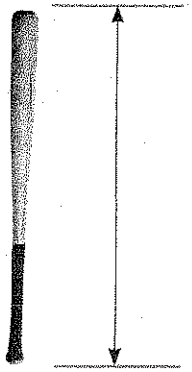
A sheet of notebook paper is about 1 foot long.

Name some things that are about 1 foot long.

_____

_____

_____



A baseball bat is about 1 yard long.

Name some things that are about 1 yard long.

_____

_____

_____

It takes about 20 minutes to walk 1 mile.

About how long would it take you to walk home from school?

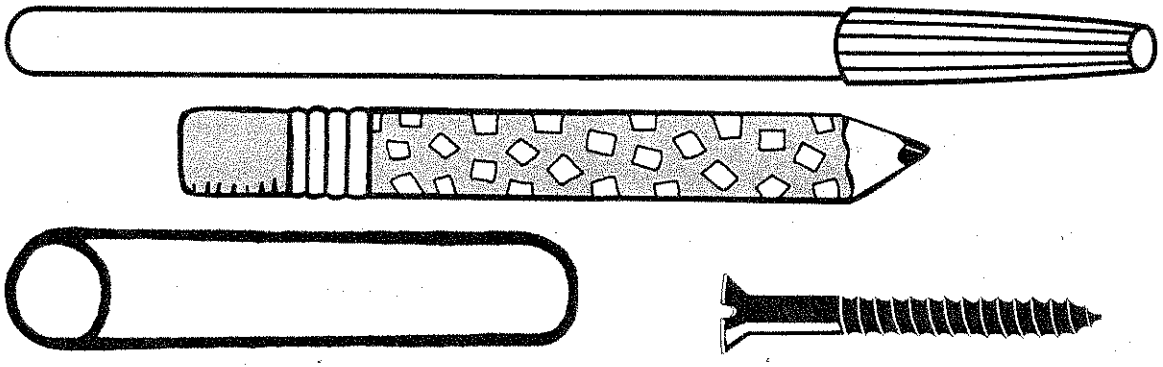
_____

Is the distance greater than or less than 1 mile?

_____

Math Talk Which is longer, 2 inches or 2 yards? Explain how you know.

Activity Estimate then measure.



STEP 1 Copy the table.

Length of Object		
Item	Estimated Measure	Actual Measurement
marker		
pencil		
chalk		
screw		

STEP 2 Estimate the length of each item. Record your estimate in the table.

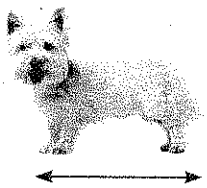
STEP 3 Measure the length of each item to the nearest inch. Record each measurement in your table.

Share and Show MATH BOARD

1. Would you measure the length of a pencil in inches or in feet? _____

Math Talk Explain how you would choose the unit to measure the length of your classroom.

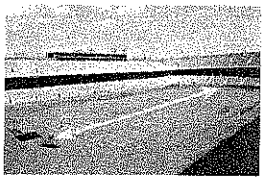
Choose the unit you would use to measure the length.
Write *inch, foot, yard,* or *mile*.

2. 

_____

3. 

_____

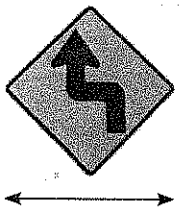
4. 

_____

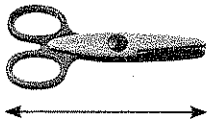
Name _____

On Your Own

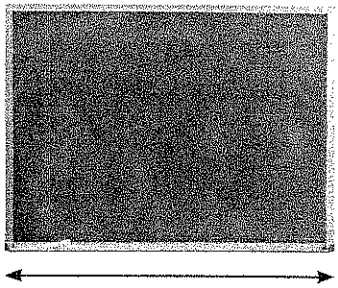
Choose the unit you would use to measure the length.
Write *inch, foot, yard,* or *mile*.

5. 

_____

6. 

_____

7. 

_____

8. a $1 bill

_____

9. the distance between two towns

_____

10. a school bus

_____

Problem Solving REAL WORLD

11. Ashley is framing a picture. The picture is 12 inches long. What is this length in feet?

_____

12. Stacy lines up several rulers that measure 36 inches altogether. What is the total length in feet?

_____

13. H.O.T. Andrew has a vegetable garden. The rows of beans are 36 inches apart. What is that distance in feet? What is that distance in yards?

_____

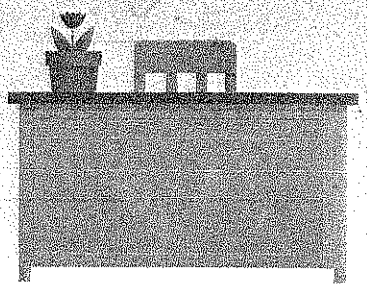
SHOW YOUR WORK

14. Write Math Adrienne visits her grandmother in another city. Does Adrienne travel 100 feet, 100 yards, or 100 miles? **Explain** your answer.

_____

_____

UNLOCK the Problem REAL WORLD



15. Mark, Karen, and Andy each measured one of these items: height of a flower, length of a desk, or width of a classroom. Each person measured with a different unit (inches, feet, or yards).

- Mark's measure was less than Andy's.
- Neither Mark nor Andy used a yardstick.

Which item did each person measure and what unit did he or she use?

a. What do you need to find? _____

b. What clues are you given? _____

_____

c. Describe the steps you used to solve the problem.

d. Complete the sentences.

_____ used a yardstick to measure the _____.

Mark's measure was _____ than Andy's. Mark measured the _____ in _____.

Andy measured the _____ in _____.

16. ★ Test Prep Ron uses a large piece of poster board to draw a picture. About how long is the poster board?

Ⓐ 4 inches Ⓒ 4 yards

Ⓑ 4 feet Ⓓ 4 miles

Name _____

Customary Units for Capacity

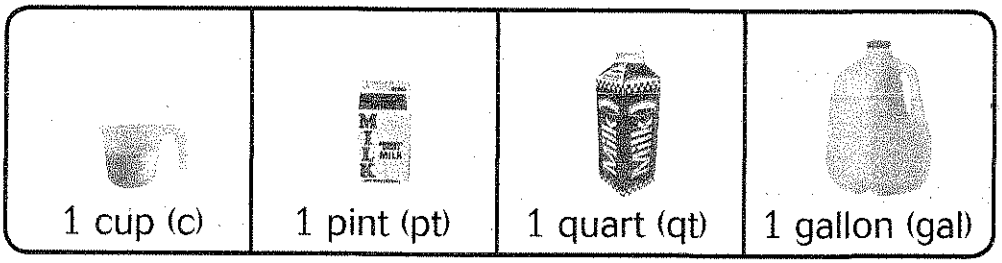
Essential Question How are cups, pints, quarts, and gallons related?

M.12.3.4 Demonstrate the relationship among different *standard units*

M.13.3.9 *Estimate* and measure length, *capacity/volume* and *mass* using appropriate customary units

Investigate

Capacity is the amount a container will hold. Customary units used to measure capacity are **cup (c)**, **pint (pt)**, **quart (qt)**, and **gallon (gal)**.



Materials ■ cup, pint, quart, and gallon containers; water

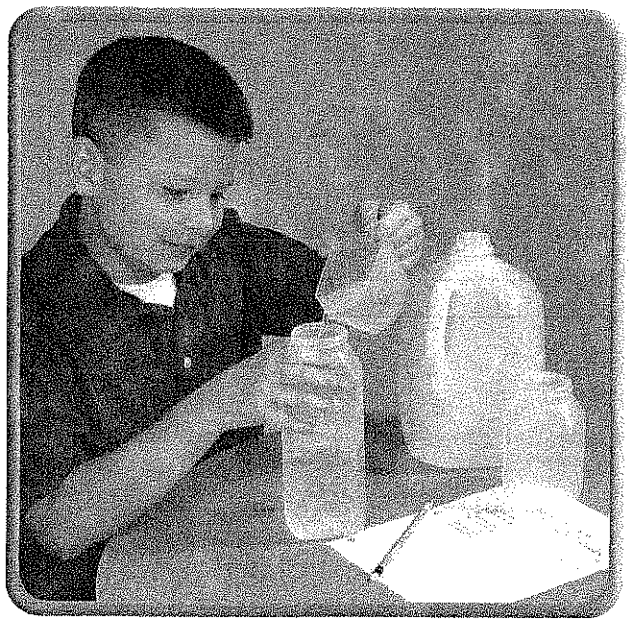
	Number of Cups		
	Number of Cups in a Pint	Number of Cups in a Quart	Number of Cups in a Gallon
Estimate			
Measure			

A. Estimate the number of cups it will take to fill the pint container. Record your estimate.

B. Fill a cup and pour it into the pint container. Repeat until the pint container is full.

C. Record the number of cups it took to fill the pint container.

D. Repeat Steps A to C for the quart and gallon containers.



Draw Conclusions

1. How do your measurements compare to your estimates?

_____

2. How many cups are in a pint? _____

   in a quart? _____ in a gallon? _____

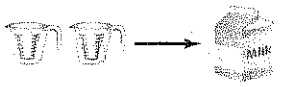
3. Which unit would you use to measure the amount of water needed to fill an aquarium? **Explain.**

_____

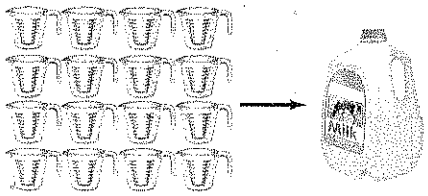
_____

Make Connections

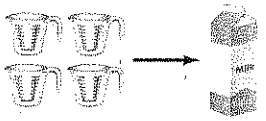
These drawings show how cups, pints, quarts, and gallons are related.



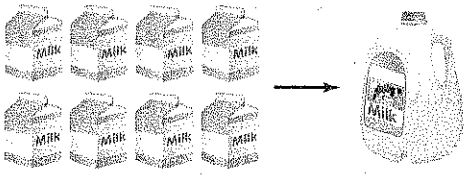
2 cups in 1 pint



16 cups in 1 gallon

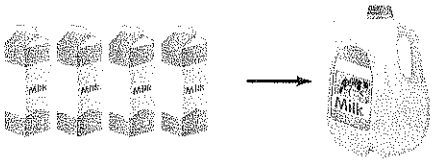


4 cups in 1 quart



8 pints in 1 gallon

2 pints in 1 quart



4 quarts in 1 gallon

Name _____

Try This!

Rename the capacity using quarts.

STEP 1 Find how cups and quarts are related.

Think: There are 4 cups in 1 quart.

STEP 2 Circle groups of four cups.

_____ _____

STEP 3 Rename each group as 1 quart.

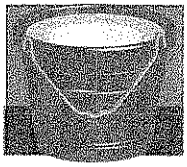
STEP 4 Count the number of quarts. So, there are 8 cups in _____ quarts.

Share and Show MATH BOARD

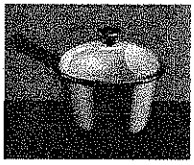
Choose the unit you would use to measure the capacity.
Write *cup*, *pint*, *quart*, or *gallon*.

1. 

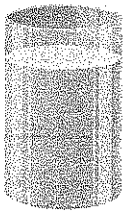
_____

2. 

_____

3. 

_____

4. 

_____

Circle the groups that equal the unit named.
Then, rename the capacity using the unit shown.

5. 

6 pints in _____ quarts

6. 

8 quarts in _____ gallons

7. 

8 cups in _____ pints

Problem Solving

SHOW YOUR WORK

8. Janet is serving lemonade. Each glass contains 1 pint. If Janet serves 16 glasses, how many gallons will she serve?

_____

9. Write Math **What's the Error?** Conner says that it takes 8 cups to fill a 2-gallon container. Is he correct? **Explain.**

_____

_____

_____

10. Mr. Velez has 8 pints of juice. How many quarts of juice does he have?

_____

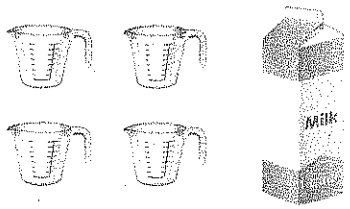
11. Lisa has 12 cups of lemonade. How many quarts of lemonade does Lisa have?

_____

12. H.O.T. Which amount is greater, 2 gallons or 7 quarts? **Explain** by drawing a picture.

_____

13. **What's the Question?** Angela used the drawing below to help answer the question. The answer is 1 quart.



_____

Name _____

Customary Units of Weight

Essential Question How are ounces, pounds, and tons related?

M.12.3.4 Demonstrate the relationship among different *standard units*

M.13.3.9 *Estimate* and measure length, *capacity/volume*, and *mass* using appropriate customary units

UNLOCK the Problem REAL WORLD

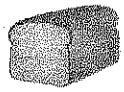
Weight is the measure of how heavy an object is. Customary units for weight include **ounce (oz)**, **pound (lb)**, and **ton (T)**.

1 lb = 16 oz
1 ton = 2,000 lb

Circle the correct word to complete the sentences.

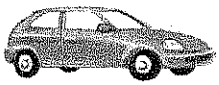
One pencil weighs

about 1 ounce. / pound. / ton.



One loaf of bread weighs

about 1 ounce. / pound. / ton.



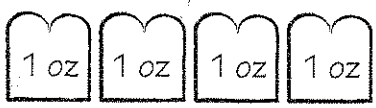
A small car weighs

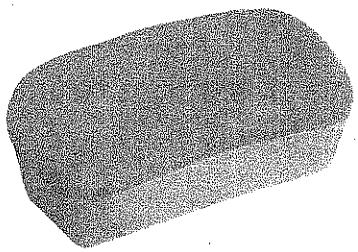
about 1 ounce. / pound. / ton.

Math Talk Suppose you weigh a bag of potatoes in pounds, and then in ounces. Which would be greater, the number of ounces or the number of pounds? Explain.

Try This!

Sixteen ounces and one pound equal the same weight. Finish the drawing of slices of bread to show how ounces and pounds are related.





____ ounces in ____ pound

Activity

Materials ■ scale, classroom objects

Weight of Objects		
Objects	Estimate	Weight
apple		
book		
pencil box		
tape dispenser		

STEP 1 Estimate the weight of the object shown in the table. Record your estimate.

STEP 2 Use a scale to measure to the nearest ounce or pound. Record the weight.

STEP 3 Repeat for each object.

Remember
Remember to include the units when recording the estimates and weights in the table.

Math Talk How do your estimates compare to the actual weights?

Share and Show

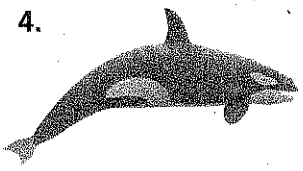
MATH BOARD

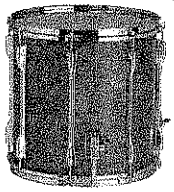
1. A strawberry weighs about 1 ounce. pound. ton.

Choose the unit you would use to measure the weight. Write *ounce*, *pound*, or *ton*.

2. 

3. 

4. 

5. 

Find an object in the classroom to match the description. Draw and label the object.

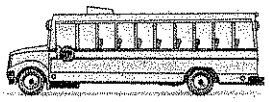
6. greater than 1 pound

7. less than 1 pound

Name _____

On Your Own

Choose the unit you would use to measure the weight.
Write *ounce*, *pound*, or *ton*.

8. 
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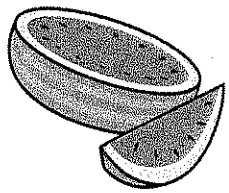
9. 
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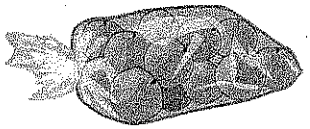
11. 
_____

Find an object in the classroom to match the description.
Draw and label the object.

12. about 8 ounces

13. more than 5 pounds

H.O.T. **Complete the table.**

14.

pounds	1	2	3	4	5
ounces	16	32	48		80

15.

pounds	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$
ounces	16	8		2

H.O.T. **Compare. Write <, >, or = in each ◯.**

16. 2 oz ◯ 2 lb

17. 16 oz ◯ 1 lb

18. 5,000 lb ◯ 2 tons

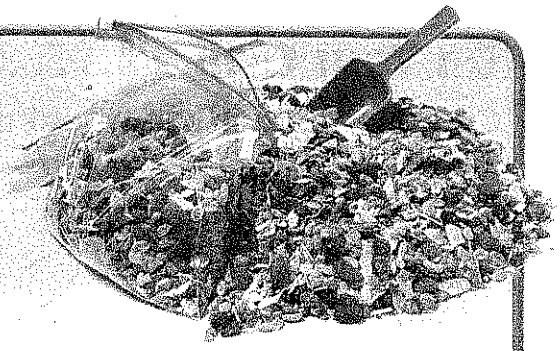
19. Write Math **Sense or Nonsense?** Hank says that 32 ounces is the same as 3 pounds. Does this statement make sense? **Explain.**

_____

_____

_____

UNLOCK the Problem REAL WORLD



20. Jared has a canister that has 48 ounces of home-made trail mix. He wants to package the mix in bags that each hold 1 pound of mix. How many bags can Jared fill?

a. What do you need to find? _____

_____

b. What are two ways to describe the amount the bags can hold?

_____

c. Show the steps you used to solve the problem.

d. Complete the sentences.

Sixteen ounces is the same weight as _____.

Each bag holds ____ ounces of mix.

48 ounces can be separated into ____ groups of ____ ounces each.

So, Jared can fill ____ bags with 1 pound of trail mix each.

21. Ellen is weighing a young elephant at the zoo. Does the scale read 4 pounds or 4 tons?

_____

22. ★ **Test Prep** There are 4 baseball caps at a store. Each cap weighs 8 ounces. How much do the caps weigh in all?

Ⓐ 8 ounces Ⓒ 2 pounds

Ⓑ 10 ounces Ⓓ 4 pounds

Name _____

Choose Appropriate Units and Tools

Essential Question How can you choose and use appropriate metric units and tools to measure length, mass, capacity, and temperature?

M.13.3.8 Use appropriate customary measurement tools for length, *capacity* and *mass*

UNLOCK the Problem REAL WORLD

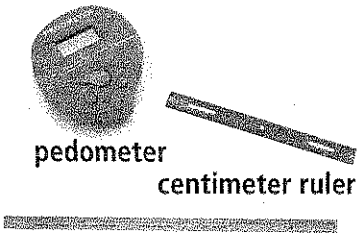
CONNECT You have learned about different metric units and tools for measuring length, mass, capacity, and temperature. Before making a measurement, be sure to choose an appropriate tool and unit of measure.

- Are you measuring how long or short something is?
- Are you measuring its mass?
- Is it a liquid?
- Are you measuring how hot or cold it is?

Example 1 Choose appropriate tools.

An object can be measured in different ways. For example, you can use a meter stick to measure your height and a thermometer to measure your temperature.

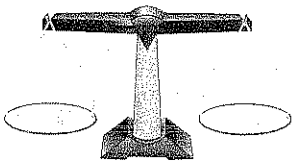
Length



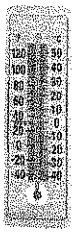
pedometer

centimeter ruler

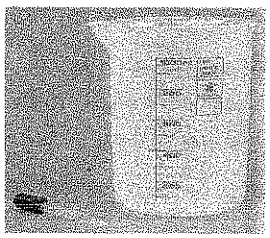
Mass



Temperature



Capacity



meter stick

Use a ruler or meter stick to measure how long an object is. Use a pedometer to measure distance.

pan balance

Use a pan balance to measure the amount of matter in an object.

thermometer

Use a thermometer to measure how cold or hot an object is.

eyedropper beaker

Use an eyedropper or beaker to measure how much a container can hold.

Fill in the table below. Use a ✓ to show all the tools you could use to measure each object.

	Length			Mass	Capacity		Temperature
	cm ruler	meter stick	pedometer	pan balance	eyedropper	beaker	thermometer
syrup in a bottle							
cell phone							
distance between classrooms							

Example 2 Choose appropriate units.

Once you decide what you are going to measure and what tool you will use to measure it, choose an appropriate unit.

Length	Mass	Capacity	Temperature
millimeter (mm) centimeter (cm) meter (m) kilometer (km)	gram (g) kilogram (kg)	milliliter (mL) liter (L)	degrees Celsius (°C)

- Do you want to measure length, mass, capacity, or temperature?
- Which unit would be most reasonable to use?
- How precise or exact do you want the measurement to be?

The smaller the unit you use, the more precise your measurement will be. Suppose you wanted to measure the capacity of a flowerpot. A measurement in milliliters would be more precise than a measurement in liters.

Choose the unit you could use to measure each object.

A Kaye is making a birdhouse. She measures and cuts a board.

Think: Are precise measurements important in carpentry?

_____

B Alicia catches a cricket and wants to know its mass.

Think: Would it be reasonable to measure its mass in kilograms?

_____

C Ryan measures water to put in a pot. He plans to cook some spaghetti.

Think: Is a precise amount of water necessary?

_____

Share and Show MATH BOARD

1. Which tool and unit could be used to measure the distance from your house to a friend's house three blocks away?

_____

Math Talk Describe a situation in which an inappropriate unit is used. Then tell what unit would be appropriate.

Choose an appropriate tool and unit.

2. Nikos checks if it is as cold outside as the newspaper reports.

_____

_____

3. Ariana has a new baby brother. She measures how tall he is.

_____

_____

4. Cabrini is making pudding. She measures just the right amount of milk to use.

_____

_____

Name _____

On Your Own

Choose an appropriate tool and unit.

5. Maura wants to give a newborn kitten the right amount of medicine.

_____

_____

6. Daniel wants to know if his water skis are too long to fit in the trunk of his car.

_____

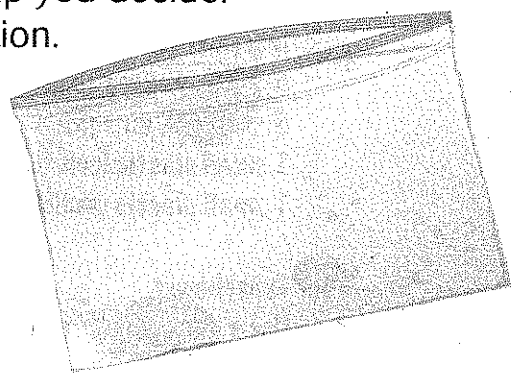
_____

7. Mr. Otis wants to know the mass of his laptop computer.

_____

_____

8. Write Math H.O.T. **Justify** Will Marissa's pencil fit in the plastic bag? Choose an appropriate tool and unit to help you decide. Then measure both objects to answer the question.



_____

_____

Problem Solving REAL WORLD

9. Which unit would be most appropriate to use when measuring how heavy a bag of apples is? _____

10. Write Math **Pose a Problem** Write a problem similar to Problem 9 that has *beaker* as its answer.

_____

11. ★ Test Prep Mitchell wants to know how much hot chocolate his thermos will hold. Which tool should he use to find out?

Ⓐ meter stick Ⓒ pan balance

Ⓑ thermometer Ⓓ beaker

Connect to Science

Conservation of Mass

Since the 1700s, scientists have used experiments to show that mass can be neither created nor destroyed.

Professor Stoll made these notes for an experiment. Unfortunately, he splattered ink all over his notes. Help Professor Stoll by filling in the words that are covered up.

Mass Conservation Experiment

Ingredients:

5 _____ baking soda

5 _____ vinegar

1 small plastic lock top bag

1 small plastic medicine cup

Experiment:

Use a _____ to measure the correct amount of baking soda.

Place the baking soda into the plastic bag.

Use an _____ to measure the correct amount of vinegar.

Place the cup with the vinegar into the bag with the baking soda. Be very careful. Do not spill the vinegar.

Squeeze the air out of the bag, and close it tightly.

Use a _____ to determine the total mass of the bag, baking soda, and the plastic cup with the vinegar in it.

Pour the vinegar out of the cup and mix it with the baking soda.

When the reaction has stopped, use a pan balance to measure the total _____ of the bag and everything in it.

Name _____

Change Units

Essential Question When do you multiply to convert measurement units?

M.12.3.5 Create and complete a conversion table (from larger unit to smaller unit) to show relationships between units of measurement in the same system

Converting units of measure can help you visualize a given measurement or compare it to another measurement. When you are converting larger units to smaller units, you multiply by the number of smaller units in a single large unit.

UNLOCK the Problem REAL WORLD

Inches, feet, and yards are units used to measure _____.

Convert feet to inches.

Feet	Inches
1	12
3	_____
7	_____

Multiply the larger unit, feet, by the number of inches in 1 foot.

Length
1 foot = 12 inches
1 yard = 3 feet
1 yard = 36 inches

Convert yards to feet.

Yards	Feet
1	3
3	_____
9	_____

Multiply the larger unit, yards, by the number of feet in 1 yard.

Apply what you know to convert yards to inches.

1 yard = ▩ inches

$1 \times 3 =$ _____ 1 yard = _____ feet Convert yards to feet.

_____ $\times 12 =$ _____ _____ feet = _____ inches Convert feet to inches.

Fill in the chart below with your answer. Use the same method to complete the rest of the chart.

Yards	Inches
1	_____
2	_____
3	_____

How many inches are in 1 yard? Multiply the number of yards by that number.

Convert units of capacity.

Cups, pints, and quarts are units used to measure capacity.

Quarts	Pints
1	2
3	_____
7	_____

Pints	Cups
1	2
3	_____
7	_____

Quarts	Cups
1	4
3	_____
7	_____

A large punch bowl holds 13 quarts. How do you determine how many cups are in 13 quarts?

How many cups are in 1 quart? _____

So, you should multiply the number of _____ by _____.

_____ × _____ = _____

So, there are _____ cups in 13 quarts.

Capacity

1 quart = 2 pints

1 pint = 2 cups

1 quart = 4 cups

Convert units of weight.

Ounces and pounds are units used to measure weight.

Pounds	Ounces
1	16
2	_____
3	_____

Think: Which number is the product if you are multiplying? What would you multiply by to get that product?

A box of sugar is marked 5 pounds. How many ounces is this?

Describe how to determine the number of ounces in 5 pounds: Ounces are smaller than pounds, so I will multiply the number of _____ by the number of _____ in a single _____.

Perform the operation:

_____ × _____ = _____

So, there are _____ ounces in 5 pounds.

Weight

1 pound = 16 ounces

Name _____

Share and Show

MATH BOARD

Write a multiplication sentence you can use to complete each conversion. Then solve.

1. 2 yards = ■ feet

_____ × _____ = _____

_____ feet

Math Talk Why do you multiply to convert from a larger unit to a smaller unit?

2. 5 feet = ■ inches

_____ × _____ = _____

_____ inches

3. 2 pounds = ■ ounces

_____ × _____ = _____

_____ ounces

4. 5 pints = ■ cups

_____ × _____ = _____

_____ cups

On Your Own

Complete the conversion table shown.

5.

Pints	Cups
1	2
5	_____
10	_____

6.

Feet	Inches
1	12
4	_____
6	_____

7.

Yards	Inches
1	_____
3	108
4	144

8.

Quarts	Cups
1	_____
3	_____
9	36

9.

Pounds	Ounces
1	16
4	_____
7	112

10.

Yards	Feet
1	3
6	_____
11	_____

UNLOCK the Problem REAL WORLD

11. H.O.T. The recipe for Mama Mia's tomato soup makes 3 gallons of soup. Each serving is 1 cup. How many servings of soup are made with the recipe?
Hint: There are 4 quarts in 1 gallon.

a. What do you need to find?

_____

b. What information do you need?

_____

c. What operation will you use?

_____

d. How much is a serving? _____

e. How many cups are in 1 pint?

_____

f. How many pints are in 1 quart?

_____

g. How many quarts are in 1 gallon?

_____

h. What is the total number of servings in 3 gallons of soup? Write a number sentence to find your answer.

_____

12. Denise is making hair bows that each use 1 foot of ribbon. She has 12 yards of ribbon. How many bows can she make? **Explain.**

SHOW YOUR WORK

_____

_____

13. ★ **Test Prep** How many inches are in 24 feet?

Ⓐ 288 in. Ⓒ 8 in.

Ⓑ 72 in. Ⓓ 2 in.

14. ★ **Test Prep** John bought 4 quarts of milk. How many 1-cup servings are in 4 quarts?

Ⓐ 4 servings Ⓒ 12 servings

Ⓑ 8 servings Ⓓ 16 servings

Name _____

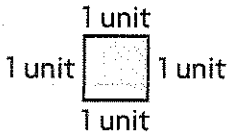
Explore Area

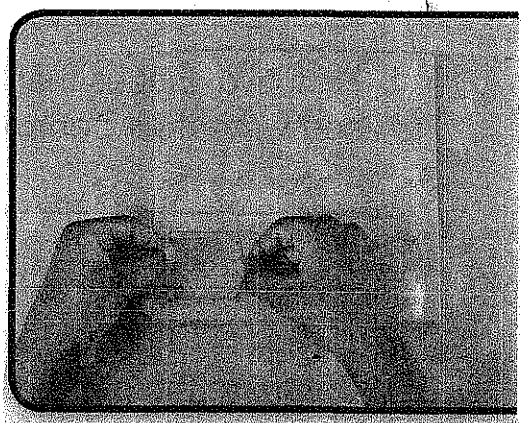
Essential Question How can you find the area of a shape?

M.13.3.11 Find the *area* of any region counting squares and half-squares

Investigate

Area is the number of square units needed to cover a flat surface. A **square unit** is a square that is 1 unit long and 1 unit wide.

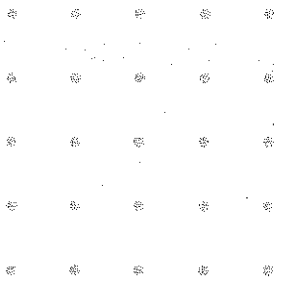




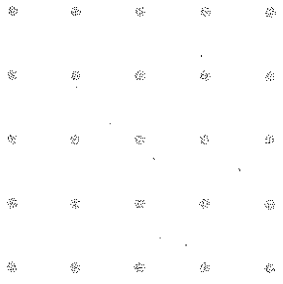
▲ This shows 1 square unit on a geoboard.

To find the area of a shape, count the number of square units inside the shape. You can use dot paper to explore the area of a shape.

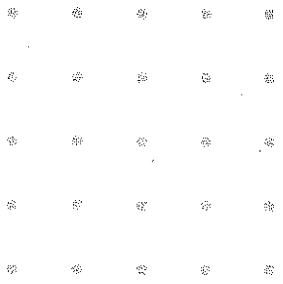
A. On the dot paper at the right, make a closed shape that has an area of 2 square units. Now make a closed shape that has an area of 3 square units.



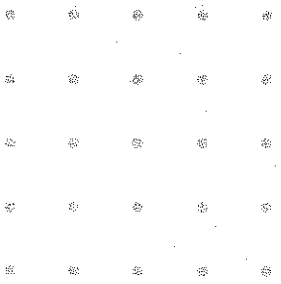
B. Make three closed shapes each with an area of 4 square units. Record each shape below.



Shape 1



Shape 2



Shape 3

Draw Conclusions

1. In Step A, how do you know that your shape has an area of 2 square units?

_____

_____

2. **Find** two shapes that have different perimeters in Step B and write their perimeters. Then compare the areas.

_____

_____

3. H.O.T. **Analyze** Look at Shapes 1–3 in Step B. Compare the perimeters of the shapes.

_____

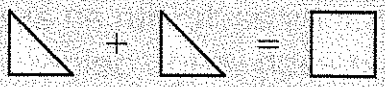
_____

Make Connections

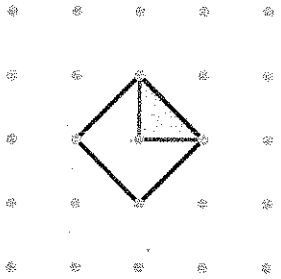
Some shapes have only half-square units. Other shapes have whole-square units and half-square units.

The white area is a half-square unit.

2 half-square units = 1 square unit



Look at the black shape at the right. What is its area?



The shape can be split into _____ half-square units.

4 half-square units = 4 ÷ 2, or _____ whole-square units

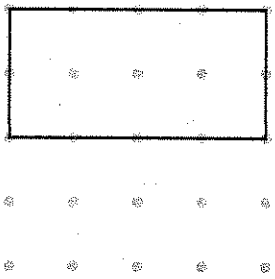
So, the area of the shape is _____ square units.

Math Talk Explain how to find the area of a shape made of 10 half squares.

Name _____

Share and Show MATH BOARD

Find the area of each shape. Write the area in square units.

1. 

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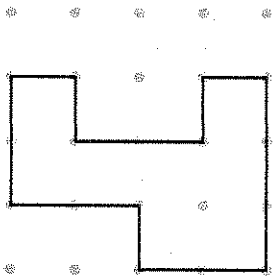
2. 

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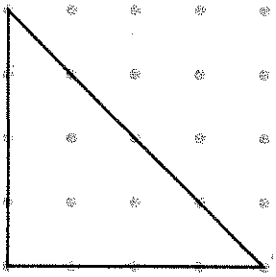
3. 

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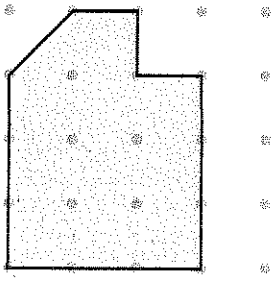
4. 

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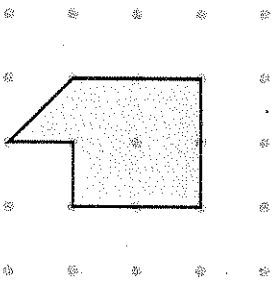
5. 

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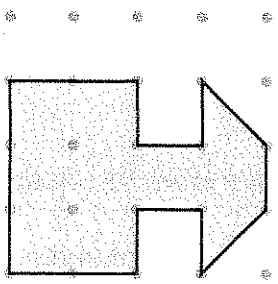
6. 

_____

7. HOT Make a shape that has an area of 6 square units and contains 6 half squares. Describe your shape.

_____

_____

_____

8. Write Math Look back at Problem 1. What happens to the area of the shape if 2 rows of 4 square units each are added to the bottom of the shape? **Explain.**

_____

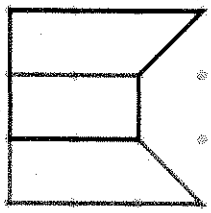
_____

_____

Problem Solving REAL WORLD

H.O.T. What's the Error?

9. Look at Diego's banner design at the right. He is making a banner for his softball team. The banner will be made from two overlapping cloth shapes, shown in the diagram with black and grey lines. What is the area of the banner?



Look at how Diego solved the problem. Find his error.

I found the area of the shapes by counting the number of whole squares.

There are 6 whole squares.

Area = 6 square units

Solve the problem and correct his error.

So, the area is _____.

- Describe Diego's error.

_____

_____

- What is another way besides division to find out how many half squares make up a whole?

_____

_____